Sun™ Ultra™ 2

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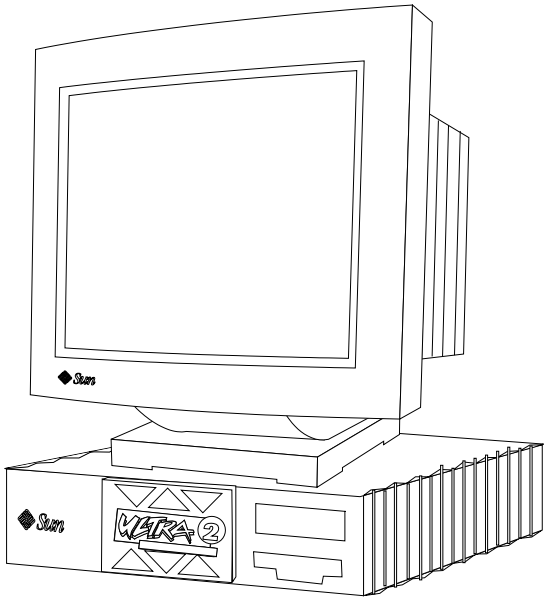
The Sun™ Ultra™ 2 System: The New Generation in Desktops



Supercomputer-Class Computing Power for the Desktop

Sun™ Ultra™ 2 is the highest-performing desktop system of the UltraSPARC™ product family. The Ultra 2 system incorporates the latest advances and technology in multiple processing, CPU, graphics, I/O, networking, and memory design. It also offers increased upgradability and expandability relative to the Ultra 1 system.

What Is New with Ultra 2?

- More configurations

  The Ultra 2 system now includes 200-MHz and 300-MHz uni-processor models, and 167-MHz, 200-MHz, and 300-MHz dual-processor models.

- Improved CPU and graphics performance

  Ultra port architecture (UPA) interconnect speed has been increased from 83 MHz to 100 MHz on 200-MHz and 300-MHz Ultra 2 systems. UPA runs at 83 MHz on 167-MHz Ultra 2 systems, but can be increased to 100 MHz when the system is upgraded to a faster processor. Additionally, in 200-MHz and 300-MHz Ultra 2 systems, faster application-specific integrated circuits (ASICs) on Creator3D combined with higher UPA bandwidth raise graphics performance by more than 20 percent over the Creator3D graphics on 167-MHz Ultra 2 systems.

- Greater memory expansion

  Ultra 2 systems now support up to 2 GB of system memory using 128-MB SIMMs, up from 1 GB.

The Sun Ultra 2 System: The New Generation in Desktops *(cont.)*

Product Line Summary

The following table summarizes the Ultra 2 product line:

	Ultra 2 Creator3D Model 2170	**Ultra 2 Creator3D Model 1200**	**Ultra 2 Creator3D Model 2200**	**Ultra 2 Creator3D Model 1300**	**Ultra 2 Creator3D Model 2300**
Processor speed	2 x 167-MHz UltraSPARC-I	1 x 200-MHz UltraSPARC-I	2 x 200-MHz UltraSPARC-I	1 x 300-MHz UltraSPARC-II	2 x 300-MHz UltraSPARC-II
External cache	0.5 MB	1 MB	1 MB	2 MB	2 MB
Maximum internal HDD	8 GB	8 GB	8 GB	8 GB	8 GB
I/O Slots	4	4	4	4	4
UPA Speed	83 MHz	100 MHz	100 MHz	100 MHz	100 MHz
Peak UPA bandwidth	1.3 GB/sec.	1.6 GM/sec.	1.6 GB/sec.	1.6 GB/sec.	1.6 GB/sec.
Maximum memory with 128-MB SIMMs	2 GB	2 GB	2 GB	2 GB	2 GB
SPECint95 SPECfp95	6.34 11.80	7.72 11.40	7.88 14.70	12.10 15.50	12.30 20.20
Xmark PLBwire93 PLBsurf93	17.3 131.5 184.0	20.8 156.5 228.2	21.5 156.5 228.2	23.0 188.1 295.5	24.3 188.1 295.5

Key Messages

- High-performance UltraSPARC CPU
  - CPU has an exceptionally high integer and floating-point performance.
  - CPU has superior application performance with either a 167-MHz UltraSPARC-I processor with a 512K external cache, a 200-MHz UltraSPARC-I processor with a 1-MB external cache, or a 300-MHz UltraSPARC-II with 2 MB of cache.
  - Faster UltraSPARC-II CPU modules will continue to be supported.
- High-throughput multiprocessing
  - Available in either a uni- or dual-processor configuration, the Sun Ultra 2 chassis has room for two processor modules, each containing one processor and an external cache.
- Faster I/O
  - Ultra 2 supports 20-MB/sec., Fast/Wide SCSI for better application performance.
  - Fast/Wide SCSI is supported internal and external through a Fast/Wide SCSI port on the system.
- High-speed networking
  - Ultra 2 provides a 10- or 100-Mb/sec. Fast Ethernet for faster network computing.
  - It works with existing cabling and is autosensing.
  - Integrated twisted pair (RJ45) and media-independent interface (MII) are included for connection to AUI, TP, Thin Net, and Fiber.

The Sun Ultra 2 System: The New Generation in Desktops *(cont.)*

Key Messages *(cont.)*

- High-bandwidth, low-latency memory interface
  - A completely redesigned memory interface provides high bandwidth, allowing customers to take advantage of the UltraSPARC performance.
  - A new 100-MHz UPA processor-to-memory interconnect delivers up to 1.6-GB/sec. peak throughput, with sustained rates of 800 MB/sec. (UPA runs at 100 MHz on the 200-MHz and 300-MHz Ultra 2 configurations and 83 MHz on the 167-MHz Ultra 2 configuration.)
  - UPA is based on a packet-switching architecture for reduced bus and memory latency. This results in improved memory access and performance.
  - A new buffered Cross Bar Switch memory interface raises memory bandwidth.
  - Wider paths to memory (576 bits) handle larger data traffic volume.
  - SIMMs are compatible with the SPARCstation™ 20, Ultra 1, and Ultra™ Enterprise™ servers.
  - Ultra 2 supports up to 2 GB of memory using 128-MB SIMMs.
- Powerful Creator and Creator3D graphics
  - Improved Creator3D graphics performance on 300-MHz Ultra 2 models.
  - Because Creator is tightly coupled to the Sun Ultra CPU, graphic performance scales up with CPU speed.
  - New UPA interconnect-based Creator and Creator3D graphics accelerate window operations, imaging, 2-D graphics, 3-D graphics, and solids.
  - The new 3D-RAM frame-buffer memory significantly boosts graphics bandwidth and 3-D performance.
  - 1280 x 1024 pixels at 76 Hz and 24-bit true color are standard.
  - Creator3D comes with a 2 x 24-bit double buffer and a 28-bit Z buffer.
  - One UPA slot is used for Creator and Creator3D graphics.
- Easily expanded and upgraded
  - CPUs are modular, allowing for easy upgrades as the new generation of CPU technology becomes available.
  - The Ultra 2 system offers the flexibility of starting with a single CPU and adding a second CPU later, as compute needs grow.
  - Sixteen memory slots and four SBus slots are available for system expansion.
  - SBus slots support all previous SBus graphics including TurboGX™, TurboGXplus™, and ZX as well as the Freedom graphics accelerators.
- Binary-compatible
  - The Ultra 2 system is binary compatible with existing applications.

The Sun Ultra 2 System: The New Generation in Desktops *(cont.)*

Availability

- Sun Ultra 2 Model 2170 began shipping in May 1996.
- Sun Ultra 2 Models 1200 and 2200 began shipping in August 1996.
- Sun Ultra 2 Models 1300 and 2300 will begin shipping in April 1997.

Sun Ultra 2 Versus Sun Ultra 1

The following table highlights the key differences between the Sun Ultra 1 and 2 desktop systems.

Key Features	Ultra 2 Models 2170, 1200, 2200, 1300, and 2300	Ultra 1 Model 200E
Product Positioning	• Best performing desktop system • Extends Ultra 2 product family	• Midrange, high-performance desktop • Extends Ultra 1 product family
CPU	• Higher clock speeds available • 300 MHz with 2-MB Ecache, 200 MHz with 1-MB Ecache, or 167 MHz with 0.5-MB Ecache • One- or two-processor configurations • Upgradable CPU • CPU on modules	• One clock speed • 200 MHz with 1-MB Ecache • One processor • CPU not upgradable • CPU on motherboard
Memory	• 16 SIMM slots • 128 MB to 2 GB • 576-bit wide path • Memory upgrades in groups of four	• 8 SIMM slots • 64 MB to 1 GB with 128-MB SIMMs • 288-bit wide path • Memory upgrades in groups of two
UPA	• Runs at 100 MHz for 200-MHz and 300-MHz systems, 83 MHz for 167-MHz systems	• Runs at 100 MHz for 200-MHz system
I/O Expansion	• Four SBus slots • Two 1-inch disk bays for 8.4-GB maximum disk storage (two 4.2-GB disks)	• Two SBus slots • Two 1-inch drive bays for 4.2-GB maximum disk storage (two 2.1-GB disks or one 1.6-inch 4.2-GB disk)
Graphics	• Faster performance due to higher CPU floating-point and UPA bus speed • Supports Creator, Creator3D, TurboGX, TurboGXplus, and ZX	• Supports Creator, Creator3D, TurboGX, and TurboGXplus
Packaging	• Expanded pizza box • 450 mm x 130 mm x 444 mm (WxHxD)	• Pizza box • 416 mm x 100 mm x 425 mm (WxHxD)
Power	• 350 W	• 180 W

In short, Ultra 2 offers:

- More power than Ultra 1
- Greater expandability than Ultra 1
- Greater upgradability than Ultra 1

Product Placement Strategy

Target Users

The Sun Ultra 2 systems are designed for the technical user who requires very high performance and multiprocessing (MP) capability. MP-ready and multithreaded applications will benefit greatly from the performance of the Sun Ultra 2 system.

The target customer is the traditional “power desktop” user who has performance and expansion requirements that exceed the capabilities of the Ultra 1 system. This includes both technical and commercial users who need the large number of applications and the functional capabilities of the Solaris™ 2.5.1 environment, the high-performance of the UltraSPARC CPU, and the integration and support capabilities provided by the Sun channels.

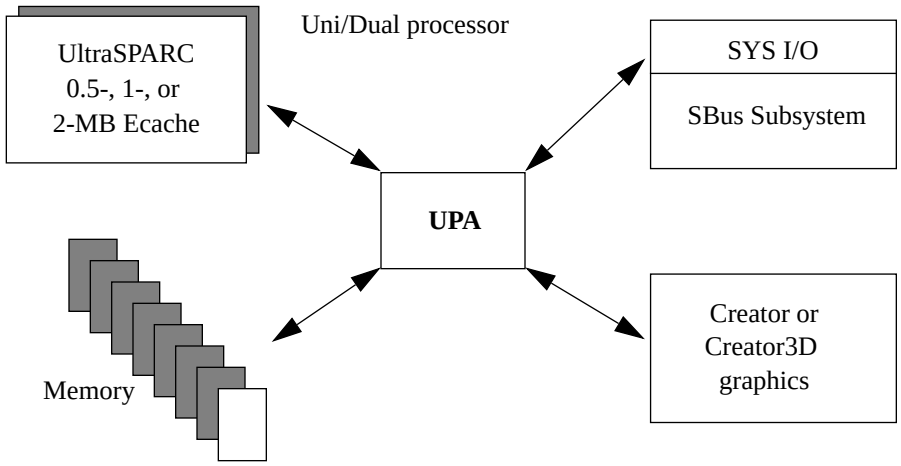
Sun Ultra 2 Target Markets

As compared to the previous generation SPARCstation products, the higher performance and price/performance ratio of the Sun Ultra 2 system, as well as its new advanced graphics and multimedia capabilities, offer increased market opportunities.

Industry	Key Features to Highlight
Software Development (CASE/RDBMS) • Independent software vendors (ISVs) • In-house development in large organizations	• High-performance Solaris environment • Availability of applications
Mechanical Design (MCAD/MCAE) • Automotive • Aerospace • Defense industry • Mechanical equipment designers	• High MP CPU performance; high-end graphics performance and functionality standard • MP configurations for high-application performance • Availability of applications
Electronic Design (EDA) • Chip designers • System houses • Telecommunications	• High MP CPU performance; high-performance graphics in entry-level configurations • Availability of applications
Research and Development • In-house development • Research institutions	• High-computational MP performance • Feature-rich Solaris environment • Availability of applications
Publishing/Imaging • Newspapers • Magazines • Image banks • Advertising agencies • Scientific visualization	• High-performance MP CPU • High-end performance and functionality for both graphics and imaging operations
Financial • Stock and commodity traders • Banks	• High-performance MP CPU • Compact design

The new level of performance and functionality make the Ultra 2 system attractive for new kinds of applications and will also attract applications previously not available for the SPARCstation platform.

More Than Just a Fast Chip
"Supercomputer-Class Performance on the Desktop"



Technology Overview

The Sun™ Ultra™ 2 desktop system represents a new step in workstation design, leveraging all the experience from the highly successful SPARCstation™ family. The new generation inherits and expands upon the modularity, expandability, and configurability that have been the trademark of all SPARCstation designs. The continued commitment to the SPARC™ architecture allows for compatibility with the largest installed base of networked workstations while boosting performance with the advanced 64-bit UltraSPARC™ processor and a design aimed at providing balanced system performance.

UltraSPARC™ Processor

- **Features**
  - Uni- or dual-processor capability
  - CPU modules
  - V9, 64-bit implementation of the SPARC definition
  - Four-way superscalar design
  - Integrated visual instruction set (VIS™)
  - Multilevel trap handling
- **Benefits**
  - High throughput for multiprocessing
  - Enables easy and inexpensive upgrades
  - Very high application performance
  - Efficient design for lower cost
  - Ready for multimedia
  - Efficient process handling

Creator3D graphics—24-bit Accelerated Graphics Standard

- **Features**
  - True color as standard
  - Acceleration for 2-D, 3-D, and imaging
  - 2 x 24-bit double buffering
- **Benefits**
  - True-color dynamic images
  - Better performance at a lower cost
  - Smooth rotation of solids

High-Speed Memory Bus

- **Features**
  - 576-bit path to memory
  - High bandwidth
  - Low latency
- **Benefits**
  - Provides greater bandwidth
  - Better application performance
  - High-performance access to memory

SBus

- **Features**
  - 25-MHz clock/ 64-bit wide
  - 133-MB/sec. bandwidth (peak)
  - Compatible with 32-bit SBus
  - Four expansion slots
- **Benefits**
  - Highest performance SBus
  - Access to many third-party solutions
  - Investment protection
  - IEEE standard

Fast/Wide SCSI

- **Feature**
  - 20-MB/sec. SCSI
- **Benefit**
  - Fast access and retrieval of mass storage

Fast Ethernet

- **Features**
  - High-performance 100BASE-T
  - Compatible with 10BASE-T
  - Autosensing
- **Benefits**
  - Fast access to network resources
  - Easy to deploy in existing environment
  - Transparent acceleration

It All Comes Together with Balanced Application Performance

Good performance through advanced applications typically demands excellent performance from more than one part of the system. Most often an application consists of data fetching, computation, and presentation. Unless the system is designed to address all of these, it will always be limited by the slowest part in the chain.

The Sun Ultra 2 desktop system is designed for balanced system performance in applications. Its UltraSPARC processor, Creator or Creator3D graphics, high-speed memory bus, SBus subsystem, Fast/Wide SCSI, and Fast Ethernet combine to accelerate every part of the sequence an application goes through. The faster I/O and networking, together with the UPA interconnect, enable fast data fetching. The UltraSPARC CPU provides supercomputing power and is able to move data very fast through the UPA to maintain processing at very high speed. The tightly integrated Creator graphics provide high-end graphics functionality and performance.

The new level of computing established with the Sun Ultra 2 system makes it possible to work differently, to use more advanced methods than were previously feasible. The system is also designed to offer these features and this kind of performance to every workstation user, which will propagate a higher efficiency throughout an organization.

Components of the New Generation System

Key Facts

- High-performance uni- or dual-processor desktop system using the UltraSPARC™ processor
- High-end graphics functionality and performance
- Balanced system design
  - Matching performance enhancement in I/O, networking, and memory access

Tech Facts

- New higher performance system bus
  - Fast access to memory and graphics
- Easy disk expansion
  - Up to 8.4 GB of internal SCSI disk storage (two 4.2-GB disks)
  - Up to 273 GB of total disk storage
- Optional removable mass storage
  - One optional internal CD-ROM drive with 4x speed or DAT tape
  - One optional floppy drive
- High-performance memory subsystem
  - Up to 2 GB with 128-MB SIMMs
  - Supports the SPARCstation™ 20, Ultra 1, and Enterprise Server SIMMs for compatibility and investment protection
  - Four-way interleaved 567-bit wide memory path
- Designed for interactive media applications
  - Integrated visual instruction set (VIS™) in the UltraSPARC CPU
  - Advanced 24-bit accelerated graphics standard
- Expansion to advanced networking
  - Built-in 100BASE-T; autosensing and autoswitchable to 10BASE-T for backward compatibility
  - MII connector for connection to other types of Ethernet transceivers and media
  - SunATM™ adapters available for the SBus to connect the system to the emerging ATM technology
- New system enclosure
  - Fits into a slightly larger pizza box than the Ultra 1 and has a new exterior design

The Sun Ultra 2 System at a Glance

Product Specifications	Sun Ultra 2 Model 2170	Sun Ultra 2 Models 1200 and 2200	Sun Ultra 2 Models 1300 and 2300
Dimensions and weight	450 mm x 130 mm x 444 mm (WxHxD) 12.3 to 16 kg (fully configured)		
CPU			
– Architecture	UltraSPARC-I	UltraSPARC-I	UltraSPARC-II
– Clock rate	167 MHz	200 MHz	300 MHz
– Cache on chip	16 Kb I / 16 Kb D	16 Kb I / 16 Kb D	16 Kb I / 16 Kb D
– External cache	0.5 MB	1 MB	2MB
– CPU module slots	Two slots	Two slots	Two slots
– Multiprocessing	Two CPUs maximum	Two CPUs maximum	Two CPUs maximum
Memory	128 MB to 2 GB (with 128-MB SIMMs)		
– Memory type	ECC		
– DRAM speed	60 ns		
– Bus width	576 bits		
– SIMM sizes	16, 32, 64, and 128 MB		
Storage	20-MB/sec. SCSI		
– Maximum internal	8.4 GB		
Maximum total	273 GB		
– Number of bays	2 x 1-inch drive bays		
I/O architecture	SBus		
– SBus	4 x 25 MHz, 64-bit slots		
– Graphics	One dedicated slot (UPA)		
– Serial ports	Two asynch (76.8 Kbaud)/synch (64 Kbaud) DB25		
– Parallel port	One Centronics compatible (DB25)		
Networking ports	TP Ethernet 100BASE-T/10BASE-T or external transceiver through MII connector plus optional ISDN, FDDI, and ATM through SBus cards		
Backup and distribution			
– Internal	Optional 3.5-inch floppy drive Optional SunCD™ 4x or 12x drive Optional 4-mm DDS2 tape Optional 8-mm tape		
– External	14-GB 8-mm tape 2.5-GB 0.25-inch tape 4- to 8-GB DDS2 4-mm tape 20-GB 4-mm DAT autoloader		
Operating system	Solaris™ 2.5.1		

The Sun Ultra 2 Graphics at a Glance

Product Highlights	Creator	Creator3D
Color monitors	20 inch	20 inch
Resolution, color planes, and visual capabilities	1280 x 1024 at 76 Hz 24-bit plus 8-bit overlay, for a total of 32 planes 1152 x 900 at 76 Hz and other programmable resolutions NTSC/PAL Stereo (960 x 680 at 112 Hz)	1280 x 1024 at 76 Hz 2 x 24-bit plus 8-bit overlay plus 4-bit stencil, for a total of 96 planes 1152 x 900 at 76 Hz and other programmable resolutions NTSC/PAL Stereo double-buffered (960 x 680 at 112 Hz)
Buffers – Double buffer – Z-buffer	 24-bit None	 2 x 24-bit 28-bit
Multimedia features	24-bit true color accelerated video playback	24-bit true color accelerated video playback
Graphics market positioning – Windowing and 2-D – 3-D wireframe – 24-bit and imaging – 3-D solids – Multimedia	 ✔ ✔ ✔ ✔	 ✔ ✔ ✔ ✔ ✔

Note: *1600 x 1280 resolution is not supported on Sun monitors*

Creator Graphics

Product Overview

Creator graphics brings a new level of graphics performance, functionality, and integration to the desktop. Creator graphics delivers 24-bit true color and high-resolution graphics as well as acceleration for window operations, 2-D and 3-D graphics, solids, and imaging. Creator graphics merges the diverse functionality found in TurboGX™, TurboGXplus™, SX, and ZX while providing significantly faster performance.

Creator graphics is available in two configurations: single-buffered, and double-buffered for increased 3-D graphics acceleration.

High Performance

Creator graphics' performance is based on a new system-level approach to designing graphics.

- UltraSPARC™ CPU
  - Creator graphics relies on the power of the UltraSPARC CPU for graphics floating-point calculations as well as the visual instruction set (VIS™) to accelerate imaging. This eliminates the need for a dedicated graphics processor and results in a significant cost advantage for Creator graphics.
- UPA graphics interconnect
  - UPA provides a high-speed, high-bandwidth interconnect among the CPU, Creator graphics, and system memory. It raises overall graphics performance while maintaining a balanced throughput. Unlike the peripheral SBus, the UPA interconnect ties Creator graphics into a direct path to the CPU and memory and delivers orders of magnitude greater bandwidth.
- Creator rendering application-specific integrated circuit (ASIC)
  - Completely new ASIC renders graphics primitives at very high speeds. Creator ASIC accelerates fills, scroll, text, lines, and polygon rendering.
- 3D-RAM graphics memory
  - A breakthrough in graphics memory provides high bandwidth and built-in acceleration for 3-D graphics.

Scalable Performance

Creator graphics' performance is expected to scale up with increases in CPU clock rate, making it unnecessary to upgrade graphics as new generations of CPU become available.

More Functionality Standard

All Creator graphics systems come with 24-bit true color standard as well as 1280 x 1024 at 76 Hz high resolution. Optional Creator3D supports 2 x 24-bit double buffer and 28-bit Z-buffer. In addition, stereo output support is built in.

Fully Compatible with Existing APIs

Creator graphics runs unmodified existing APIs, including X11, XIL™, XGL™, and OpenGL graphics libraries.

Creator Graphics Models

Creator graphics is offered in two models: Creator and Creator3D. These models are physically different boards. A Creator board cannot be upgraded to a Creator3D board by adding more 3D-RAM memory.

- Creator
  - Standard on Sun™ Ultra™ 2 Creator Model systems
  - Limited 3-D acceleration
  - Replaces TurboGX™ and SX graphics
  - Suited for 2-D graphics, windowing, and imaging applications, including CASE, EDA, medical imaging, and general research
  - 24-bit true color single buffered
  - 8-bit overlay and visual planes
  - Stereo display up to 960 x 680 x 32 single buffered
  - 5-MB 3D-RAM memory
  - 1280 x 1024 at 76 Hz standard with programmable bootprom resolution
  - 64-bit discretionary access control (DAC)
- Creator3D
  - Standard on Sun Ultra 2 Creator3D Model systems
  - Full 3-D acceleration
  - Replaces ZX and TurboZX™
  - Ideal for 3-D graphics and solids in MCAD and MCAE as well as high-end imaging applications
  - 2 x 24-bit true color double buffering
  - 28-bit Z buffer
  - 8-bit overlay and visual planes plus a 4-bit stencil plane, for a total of 96 planes
  - Stereo display up to 960 x 680 x 32 double and Z buffered
  - 15-MB 3D-RAM memory
  - 1280 x 1024 at 76 Hz standard with programmable bootprom resolution
  - 128-bit DAC

Graphics Performance

Parameter	Model 2170 Creator3D	Model 1200 Creator3D	Model 2200 Creator3D	Model 1300 Creator3D	Model 2300 Creator3D
Xmark	17.3	20.8	21.5	23	24.3
3-D vectors/sec.	2433	2763	2763	2767	2767
3-D antialiased vectors/sec.	1431	1758	1758	1733	1733
3-D triangles/sec.	753	930	930	979	979
3-D quads/sec.	269	323	323	355	355
PLBwire93	131.5	156.5	156.5	188.1	188.1
PLBsurf93	184	228.2	228.2	295.5	295.5

- 3-D vectors are 10-pixel, chained, parallel projection.
- Antialiased 3-D vectors are 10-pixel, chained, parallel projection.
- Triangles are 50-pixel 3-D triangles, one light (ambient, diffuse, chained, perspective, Gouraud shaded, Z buffered with culling).
- Quads are 100-pixel 3-D quads, one light (ambient, diffuse, isolated, perspective, Gouraud shaded, Z buffered with culling).

Sun™ Ultra™ 2 Software

Solaris™ Operating Environment

The Sun™ Ultra™ 2 system includes the industry's leading enterprise operating system, Solaris™ 2.5.1. Built on the latest UNIX® technology, the Solaris environment delivers unparalleled scalability and performance. With enterprise integration by design, Solaris provides easy access to a wide range of computing environments and network technologies. The Solaris environment delivers a competitive advantage to business through networked computing, scalability, and multi-architecture support. It provides an advanced superior solution for all customer IT needs, both technical and business. Solaris is an industrial-grade solution with the performance, quality, and robustness to deliver mission-critical reliability.

For technical desktop users, the Solaris environment delivers a unique advantage by providing features and functionality that combine with built-in networking to give users a high-performance computing environment, enabling faster, higher quality, and more productive work.

For graphics and performance-intensive computing such as design automation, finance, and data visualization, Solaris provides the power, performance, and innovation that businesses need to compete.

The Solaris 2.5.1 operating environment delivers the power of the Sun Ultra 2 system to users through enhanced networking capabilities and performance, graphics and imaging, increased standards compliance, and key operating system performance advancements.

- **Features**
  - Solaris 2.5.1 operating environment
  - Multithreaded operating environment
  - Over 3300 native Solaris 2 applications
  - Solaris 1 compatible
  - Graphics: Foundation-layer libraries
  - Common Desktop Environment (CDE)
  - Wabi™ 2.1
  - Multinetworking integration
  - High NFS™ and transaction performance
  - Object technology
- **Benefits**
  - Industry-leading enterprise operating system
  - High performance and scalability
  - Wide range of tuned and tested applications
  - Backward-compatible to thousands of additional Solaris 1.x applications
  - Compatible with feature-rich and industry-standard graphics libraries
  - Industry-standard, multivendor graphical user interface (GUI)
  - Access to the most popular PC applications and application suites
  - Transparent access to PC and enterprise networking resources
  - Strong workgroup server performance
  - Supports OMG/CORBA-compliant Solaris NEO™ object environment

Tech Facts

- Sun Ultra 2 requires Solaris 2.5.1

Tech Facts *(cont.)*

- Solaris 2.5.1 is the most robust, highest quality, and best performing version of the Solaris operating environment. It takes advantage of UltraSPARC™ processor enhancements and provides a reliable, stable platform for mission-critical applications.
- Features integrated into Solaris 2.5.1:
  - SPARCstorage™ Array drivers
  - PCMCIA drivers
  - In-kernel *telnet* and *rlogin* support
  - Kernel asynchronous I/O
  - XGL™ 3.2, XIL™ 1.2.1, Solaris™ PEX™ 3.0, OpenWindows™ 3.5, and OpenGL
- New in Solaris:

  Improved Performance
  - Optimized support for *Sun4u* architecture, utilizing the UltraSPARC processor's extra floating-point registers, visual instruction set (VIS™), accelerated *bcopy* and *bzero* functions, and separate kernel and user address spaces
  - Improvements to virtual memory system and kernel memory allocation to decrease system memory requirements and boost large system performance
  - Faster pipes and standard I/O to increase application I/O performance
  - NFS version 3, to provide faster network file writes and directory reads and to reduce server loading
  - NFS over TCP, for better performance over wide-area networks
  - Improved network file locking (*lockd*) for faster and more reliable distributed file locking
  - NSC (Name Service Cache), providing very fast name service lookups, speeding directory, mail, and http accesses

  Improved Security
  - Access control lists and NIS+ password aging

  Increased Standards Support
  - Posix threads (1003.1c) support
  - Full X/Open® xpg4/xcu4 branding
  - X/Open XFN federated naming, allowing two or more naming service to cooperate
  - Kodak Color Management System
  - CDE 1.0.1, Wabi 2.1, and ODBC 2 copackaged

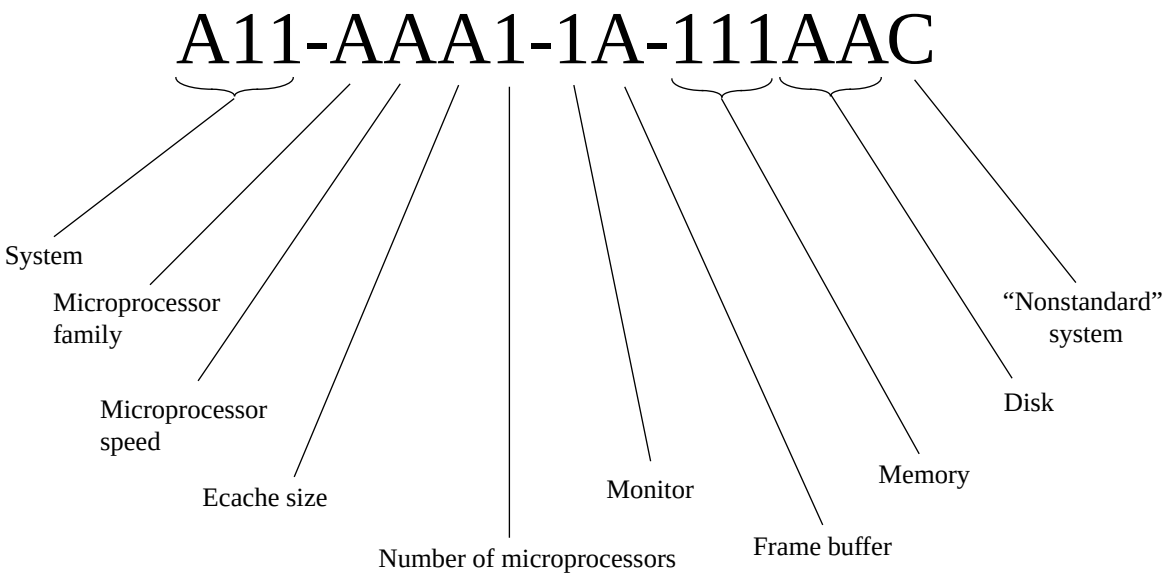
  Improved Solaris 1 Compatibility
  - Support for Solaris 1 binaries that utilize a mixture of static and dynamically-linked libraries
  - Additional Solaris 1 commands and library interfaces
- The Solaris environment connects users to the enterprise.
  - Provides connectivity to and integration with other enterprise resources
  - Supports the applications, tools, and services to retrieve, process, and manage information
  - Provides a user interface to present information; facilitates communication through a graphical user interface and graphics, imaging, and other technology

Ordering Information

A New Marketing Order Number Scheme

The Sun™ Ultra™ systems use a new marketing part number scheme that is designed to provide greater flexibility and expandability. Below is an explanation of how to read the new part numbering scheme. “N” means “Not available” or “Not applicable.”

Model



(Note: A = Alpha character, 1 = Numeric character, C = Optional alpha or numeric character)

Key

System	**Ecache Size**	**Frame Buffer**	**Disk**
A11 = Sun Ultra 1 Models 140 and 170	A = 0.5 MB	A = TurboGX™	AA = 1 GB
A12 = Sun Ultra 1 Model 170E	B = 1 MB	B = TurboGXplus™	AB = 2.1 GB
A13 = Reserved	C = 2 MB	C = Freedom 1200	AC = 4.2 GB
A14 = Sun Ultra 2	D = 4 MB	D = Freedom 3200	
		E = Creator	CA = 1 GB + CD-ROM
Microprocessor Family	**Monitor**	F = Creator3D	CB = 2.1 GB + CD-ROM
U = UltraSPARC™	1 = 20-inch color	G = Reserved	CC = 4.2 GB + CD-ROM
	2 = 17-inch color	H = Freedom 3300	
Microprocessor Speed	3 = 17-inch color (low cost)	N = No frame buffer	DA = 2 x 1 GB
A = UltraSPARC 143 MHz	4 = 20-inch color (Southern hemisphere)	S = Server	DB = 2 x 2.1 GB
B = UltraSPARC 167 MHz	5 = 17-inch color (Southern hemisphere)		EA = 2 x 1 GB + CD-ROM
C = UltraSPARC 200 MHz	6 = 17-inch color (low cost) (Southern hemisphere)	**Memory**	EB = 2 x 2.1 GB + CD-ROM
D = UltraSPARC 250 MHz	9 = Headless	128 = 128 MB	
E = UltraSPARC 300 MHz		256 = 256 MB	MA = CB + multimedia-KIT
		512 = 512 MB	MB = CB + multimedia-KIT (UK)
		001 = 1 GM	MC = CB + multimedia-KIT (Europe)
			NN = Diskless

Ordering Information *(cont.)*

A Note on Ultra 2 Memory Configurations

Because memory needs to be upgraded in groups of four SIMMs of the same type in Ultra 2 systems, a customer anticipating adding more memory in the future should purchase a large initial memory configuration.

Amount of memory in standard configurations	SIMMs	Maximum memory using 16-MB SIMMs	Maximum memory using 32-MB SIMMs	Maximum memory using 64-MB SIMMs	Maximum memory using 128-MB SIMMs
128 MB	4 x 32 MB	320 MB	512 MB	896 MB	1664 MB
256 MB	4 x 64 MB	448 MB	640 MB	1024 MB	1792 MB
1 GB	8 x 128 MB	1128 MB	1256 MB	1512 MB	2048 MB

Sun Ultra 2 Model 2170

Order Number	Description
A14-UBA2-1E-128AB	Dual 167-MHz UltraSPARC-I with 0.5-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator graphics, 128-MB memory, 2.1-GB fast SCSI-2 disk
A14-UBA2-1F-128AB	Dual 167 MHz UltraSPARC-I with 0.5-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator3D graphics, 128-MB memory, 2.1-GB fast SCSI-2 disk

Sun Ultra 2 Model 1200

Order Number	Description
A14-UCB1-1E-128AC	Uni 200-MHz UltraSPARC-I with 1-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator graphics, 128-MB memory, 4.2-GB Fast/Wide SCSI-2 disk
A14-UCB1-1F-128AC	Uni 200-MHz UltraSPARC-I with 1-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator3D graphics, 128-MB memory, 4.2-GB Fast/Wide SCSI-2 disk

Ordering Information *(cont.)*

Sun Ultra 2 Model 2200

Order Number	Description
A14-UCB2-1E-256AC	Dual 200-MHz UltraSPARC-I with 1-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator graphics, 256-MB memory, 4.2-GB Fast/Wide SCSI-2 disk
A14-UCB2-1F-256AC	Dual 200-MHz UltraSPARC-I with 1-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator3D graphics, 256-MB memory, 4.2-GB Fast/Wide SCSI-2 disk
A14-UCB2-1F-001AC	Dual 200-MHz UltraSPARC-I with 1-MB external cache, 100-Mbit Ethernet, Fast/Wide SCSI, 20-inch color monitor, Creator3D graphics, 1-GB memory, 4.2-GB Fast/Wide SCSI-2 disk

Sun Ultra 2 Model 1300

Order Number	Description
A14-UEC1-1E-128AC	Uni 300-MHz UltraSPARC-II, 2-MB cache, Creator graphics, 128-MB memory (four 64-MB SIMMs), 4.2-GB Fast/Wide SCSI-2 disk, 20-inch color monitor
A14-UEC1-1F-128AC	Uni 300-MHz UltraSPARC-II, 2-MB cache, Creator3D graphics, 128-MB memory (four 64-MB SIMMs), 4.2-GB Fast/Wide SCSI-2 disk, 20-inch color monitor

Sun Ultra 2 Model 2300

Order Number	Description
A14-UEC2-1F-256AC	Dual 300-MHz UltraSPARC-II, 2-MB cache, Creator3D graphics, 256-MB memory (four 64-MB SIMMs), 4.2-GB Fast/Wide SCSI-2 disk, 20-inch color monitor
A14-UEC2-1E-256AC	Dual 300-MHz UltraSPARC-II, 2-MB cache, Creator graphics, 256-MB memory (four 64-MB SIMMs), 4.2-GB Fast/Wide SCSI-2 disk, 20-inch color monitor
A14-UEC2-1F-001AC	Dual 300-MHz UltraSPARC-II, 2-MB cache, Creator3D graphics, 1-GB memory (eight 128-MB SIMMs), 4.2-GB Fast/Wide SCSI-2 disk, 20-inch color monitor

Sun™ Ultra™ 2 Options

Below is a partial list of system expansion, networking, graphics, and multimedia options available for Sun™ Ultra™ 2 systems. Refer to the Sun Price Book for complete option listings, configuration notes, and ordering information.

Order Number	Option description	Comments
CPU		
X1187A	167-MHz UltraSPARC-I CPU Module with 0.5-MB external cache	
X1188A	200-MHz UltraSPARC-I CPU Module with 1-MB external cache	
X1191A	300-MHz UltraSPARC-II CPU Module with 2-MB external cache	
Memory		
X7001A	32-MB 60-ns SIMM memory expansion (2 x 16 MB)	These are pairs of SIMM units—order two of each
X7002A	64-MB 60-ns SIMM memory expansion (2 x 32-MB)	
X7003A	128-MB 60-ns SIMM memory expansion (2 x 64-MB)	
X7004A	256-MB 60-ns SIMM memory expansion (2 x 128-MB)	
Internal Mass Storage		
X5153A	2.1-GB 7200-rpm internal Fast/Wide SCSI-2 disk	
X5214A	4.2-GB 7200-rpm internal Fast/Wide SCSI-2 disk	
X6212A	14-GB 8-mm tape internal	
X6282A	12- to 24-GB 4-mm DDS-3 tape internal	
X6003A	3.5-inch 1.44-MB internal floppy drive with cable	
X6156A	644-MB internal SunCD™ 4 CD-ROM drive with cable	
X6105A	2.5-GB QIC tape internal with cable	
X3860A	Fast/Wide SCSI-2 cable	
External Mass Storage: MultiPacks		
X5511A	4.2-GB (2 x 2.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5512A	12.6-GB (6 x 2.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5513A	25.2-GB (12 x 2.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5514A	8.4-GB (2 x 4.2-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5515A	25.2-GB (6 x 4.2-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5516A	50.4-GB (12 x 4.2-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5504A	18.2-GB (2 x 9.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5505A	36.4-GB (4 x 9.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
X5506A	54.6-GB (6 x 9.1-GB) 7200-rpm Fast/Wide SCSI-2 MultiPack	
External Mass Storage: UniPacks	*The following UniPack options come with a 68-68 pin SCSI cable:*	
X5151A	2.1-GB 7200-rpm Fast/Wide SCSI-2 disk UniPack	
X5209A	4.2-GB 7200-rpm Fast/Wide SCSI-2 disk UniPack	
X5253A	9.1-GB 7200-rpm Fast/Wide SCSI-2 disk UniPack	
X6208A	14-GB 8-mm tape UniPack	
X6230A	20- to 40-GB 8-mm tape UniPack	
X6101A	2.5-GB QIC tape UniPack	
X6157A	SunCD 12x UniPack	
X6151A	SunCD 4x UniPack	
X6261A	4 to 8-GB 4-mm DDS-2 tape UniPack	
X6280A	12 to 24-GB 4-mm DDS-3 tape UniPack	

Sun Ultra 2 Options *(cont.)*

Order Number	Option description	Comments
External Mass Storage: FlexiPacks	*The following FlexiPack options come with a 68-68 pin SCSI cable:*	
X6290A	72- to 144-GB 4-mm DDS-3 autoloader tape FlexiPack	
X6232A	20- to 40-GB 8-mm tape FlexiPack w/ additional open half-height expansion bay	
X6210A	14-GB 8-mm tape FlexiPack with additional open half-height expansion bay	
X6284A	12- to 24-GB 4-mm DDS-3 tape FlexiPack w/ additional open half-height expansion bay	
X6263A	4- to 8-GB 4-mm DDS-2 tape FlexiPack w/ additional open half-height expansion bay	
X6159A	SunCD 12x FlexiPack w/ additional open half-height expansion bay	
	Expansion Drives for FlexiPacks:	
X6265A	4- to 8-GB 4-mm DDS-2 internal tape for FlexiPack	
X6236A	20- to 40-GB 8-mm internal tape for FlexiPack	
X6161A	SunCD 12x internal CD-ROM for FlexiPack	
SBus Options		
X1025A	SunFDDI™ 5.0 single-attach SBus adapter (SAS)	
X1026A	SunFDDI 5.0 dual-attach SBus adapter (DAS)	
X1008A	Serial Parallel Controller (SP/C)	
X1018A	SunSwift™ 100Base-T Fast/Wide SCSI bus adapter	
X1012A	SunISDN™ expansion kit, card, certification labels, and enabling kit	
X1014A	Token ring interface/SBus (TRI/S) for Solaris™ 2.x	
X1019A	High-speed serial interface/SBus (HSI/S) for Solaris 2.x	
X1053A	SBus fast SCSI-2/buffered Ethernet card (FSBE/S)	
X1054A	SBus SCSI/buffered Ethernet card (SBE/S)	
X1062A	SBus Fast/Wide differential intelligent SCSI-2 host adapter (DWIS/S)	
X1063A	SBus single-ended Fast/Wide Intelligent SCSI-2 host adapter (SWIS/S)	
X1055A	SBus SCSI host adapter	
X1058A	SBus quad Ethernet controller (SQEC)	
X1059A	SunFastEthernet™ 10/100 SBus adapter 2.0	
X1021A	SBus Prestoserve™ NFS accelerator	
X1030A	PCMCIA interface/SBus card	
X1060A	SunATM™-155/MFiber SBus adapter 2.0	
X1061A	SunATM-155/UTP5 SBus adapter 2.0	
X1064A	SunATM-622/MFiber SBus adapter	
X1129A-4.1-P	SunPC™ 133-MHz 5x86 card, and SunPC 4.1 software	

Sun Ultra 2 Options *(cont.)*

Order Number	Option description	Comments
SunVideo and Multimedia		
X1085A	SunVideo™ real-time video board, and documentation	
X488A-EU	Multimedia kit, SunVideo, camera, and documentation (Continental Europe)	
X488A-O	Multimedia kit, SunVideo, camera, and documentation (Japan logoless)	
X488A-UK	Multimedia kit, SunVideo, camera, and documentation (U. K.)	
X488A	Multimedia kit, SunVideo, camera, and documentation (U. S.)	
X4886A-EU	Color video camera (Continental Europe)	
X486A-O	Color video camera (Japan logoless)	
X486A-UK	Color video camera (U. K.)	
X486A	Color video camera (U. S.)	
Monitors and Graphics Accelerators		
X322A	17-inch color monitor, TurboGX™ frame buffer, and cable	
X359A	20-inch color monitor, TurboGX frame buffer, and cable	
X367A	20-inch color monitor, TurboGXplus™ frame buffer, and cable	
X3651A	20-inch color monitor, Creator 24-bit single-buffered graphics accelerator	
X3652A	20-inch color monitor, Creator3D 24-bit double-buffered graphics accelerator	
Input Devices		
X180A	SunButtons™ 32-key function I/O device	
X190A	SunDials™ 8-dial interactive graphics I/O device for 3-D	

Sun™ Ultra™ 2 Upgrades

Sun™ Upgrades offer customers superior investment protection for their existing Sun equipment. Upgrading a SPARCstation™ 20 system is as easy as swapping the existing chassis, system board, and module for a next generation Sun™ Ultra™ 2 chassis and system board. By migrating existing memory, graphics, disks, and all external devices, Sun provides customers outstanding value for their existing investments.

Please refer to the Sun Price Book for updated information about upgrades and upgrade prices.

Key Messages

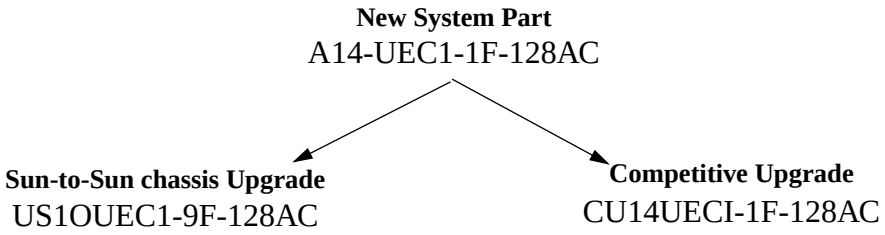
- Sun offers customers a variety of flexible upgrade paths to the most popular Sun systems.
- Choose from module-only to full-system upgrades.
- Sun upgrades allow as many components to be carried forward as possible, to protect the hardware investment of the customer.
- Existing investments in non-Sun hardware can be preserved by upgrading to Sun through competitive full-system upgrades.
- SPARCstation 20, SPARCstation 5, and SPARCstation 4 upgrades offer superior value by allowing the migration of memory, disks, and graphics to Sun Ultra 2 and UltraServer™ 2 systems.

Sun Ultra 2 Model Upgrade Paths

Upgrade Order Number	Receive	Return
SPARCstation 4 or 5	New chassis including Creator graphics, memory, no disk	Chassis including CPU, frame buffer, and memory
SPARCstation 10	New chassis including Creator graphics, memory, disk	Chassis including CPU, memory, internal disk, and frame buffer
SPARCstation 20	New chassis including Creator graphics, no memory, no disk	Chassis including CPU and frame buffer
Sun Ultra 1 Model 140 or Model 170	New chassis, Creator graphics, no memory, no disk	Chassis including CPU and frame buffer
Sun Ultra 1 Model 170E, Ultra Enterprise 1, or SPARCstation 20ZX	New chassis, no graphics, no memory, no disk	Chassis including CPU
Sun Ultra 2 Models 1170 or 1200	New faster CPU module	Existing CPU module
Any SPARCstation	Complete Ultra 2 including Creator graphics, memory, disk, monitor	Complete SPARC system including monitor, CPU, memory, internal disk, and frame buffer
Competitive system	Complete Ultra 2 including Creator graphics, memory, disk, and monitor	Complete competitive system including all components

Sun Ultra 2 Upgrades *(cont.)*

Marketing Upgrade Numbering Scheme



- Differences between the upgrade and new system part numbers lie in the first few characters; the remainder of the trailing characters carry the same interpretation as new system parts.
- Sun-to-Sun upgrades begin with U or UG; competitive upgrades begin with CU.
- Sun-to-Sun upgrades show the “from” path system in the first three characters that follow the U or UG.
- Character representations following the “from” system have the same interpretation as new system parts, but dashes may be removed from left to right, as necessary, to meet the maximum part number length of 18 characters.

Graphics Upgrades to Creator3D

Order Number	Description
UG-FFB-SB-DB	– Graphics upgrade from Creator to Creator3D graphics

Module Upgrades to Sun Ultra 2 Model 1300 and 2300

Order Number	Description
UG-M1XXX-M1300	– Module Upgrade from Ultra 2 Model 1170 or Model 1200 to Model 1300
UG-M2XXX-M2300	– Module Upgrade from Ultra 2 Model 2170 or Model 2200 to Model 2300

Upgrades to Sun Ultra 2 System Model 2170

Order Number	Description
U12-UBA2-9N-000NN	– Chassis upgrade from Sun Ultra 1 170E, Ultra Enterprise 1, or SPARCstation 20ZX to Sun Ultra 2 Model 2170, no graphics
U11-UBA2-9E-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 2170 with Creator graphics
US20UBA2-9E-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 2170 with Creator graphics
US10UBA2-9E-128AB	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2170 with Creator graphics, 128-MB memory, 2.1-GB internal disk
U11-UBA2-9F-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 2170 with Creator3D graphics
US20UBA2-9F-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 2170 with Creator3D graphics
UG10-14UBA29F128AB	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2170 with Creator3D graphics, 128-MB memory, 2.1-GB fast internal disk

Upgrades to Sun Ultra 2 System Model 1200

Order Number	Description
U12-UCB1-9N-000NN	– Chassis upgrade from Sun Ultra 1 170E, Ultra Enterprise 1, or SPARCstation 20ZX to Sun Ultra 2 Model 1200 with no graphics
U11-UCB1-9E-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 1200 with Creator graphics
US20UCB1-9E-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 1200 with Creator graphics
US10UCB1-9E-128AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 1200 with Creator graphics, 128-MB memory, 4.1-GB internal disk
US5-UCB1-9E-128NN	– Chassis upgrade from SPARCstation 4 or 5 to Sun Ultra 2 Model 1200 with Creator graphics, 128-MB memory
UFS-UCB1-1E-128AC	– Full system upgrade from any SPARCstation to Sun Ultra 2 Model 1200 with Creator graphics, 128-MB memory, 4.1-GB fast internal disk, 20-inch color monitor
U11-UCB1-9F-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 1200 with Creator3D graphics
US20UCB1-9F-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 1200 with Creator3D graphics
US10UCB1-9F-128AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 1200 with Creator3D graphics, 128-MB memory, 4.1-GB fast internal disk
UFS-UCB1-1F-128AC	– Full system upgrade from any SPARCstation to Sun Ultra 2 Model 1200 with Creator3D graphics, 128-MB memory, 4.1-GB fast internal disk, 20-inch color monitor
UG-M1170-M1200	– Module upgrade from Sun Ultra 2 Model 1170 to Model 1200
CU14UCB1-1E-128AC	– Full system upgrade from Sun3/386i or any competitive system to Sun Ultra 2 Model 1200 with Creator graphics, 6128-MB memory, 4.1-GB fast internal disk, 20-inch color monitor
CU14UCB1-1F-128AC	– Full system upgrade from Sun3/386i or any competitive system to Sun Ultra 2 Model 2170 with Creator3D graphics, 128-MB memory, 4.1-GB disk, 20-inch color monitor

Upgrades to Sun Ultra 2 System Model 2200

Order Number	Description
U12-UCB2-9N-000NN	– Chassis upgrade from Sun Ultra 1 Model 170E, Ultra Enterprise 1, or SPARCstation 20ZX to Sun Ultra 2 Model 2200, no graphics
U11-UCB2-9E-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 2200 with Creator graphics
US20UCB2-9E-000NN	– Chassis upgrade from SPARCstation™ 20 to Sun Ultra 2 Model 2200 with Creator graphics
US10UCB2-9E-256AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2200 with Creator graphics, 256-MB memory, 4.1-GB internal disk
U11-UCB2-9F-000NN	– Chassis upgrade from Sun Ultra 1 Model 140 or 170 to Sun Ultra 2 Model 2200 with Creator3D graphics
US20UCB2-9F-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 2200 with Creator3D graphics
US10UCB2-9F-256AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2200 with Creator3D graphics, 256-MB memory, 4.1-GB internal disk
CU14UCB2-1E-256AC	– Full system upgrade from Sun3/386*i* or any competitive system to Sun Ultra 2 Model 2200 with 256-MB memory, 4.1-GB fast internal disk, Creator graphics, 20-inch color monitor
CU14UCB2-1F-256AC	– Full system upgrade from Sun3, 386*i*. or any competitive system to Sun Ultra 2 Model 2200 with 256-MB memory, 4.1-GB fast internal disk, Creator3D graphics, 20-inch color monitor

Upgrades to Sun Ultra 2 System Model 1300

Order Number	Description
UG10-UEC1-9E-128AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 1300 with 128-MB RAM memory, 4-GB fast internal disk, with Creator graphics
UGFS-UEC1-1E-128AC	– Full system upgrade from any SPARCstation to Sun Ultra 2 Model 1300 with 138-MB RAM memory, 4-GB fast internal disk, Creator graphics, 20-inch color monitor
UG10-UEC1-9F-128AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 1300 with 128-MB RAM memory, 4-GB fast internal disk, Creator3D graphics
UA12-UEC1-9N-000NN	– Sun Ultra Model 170E, Model 200E, SPARCstation 20ZX or Ultra Enterprise 1 chassis upgrade to Sun Ultra 2 Model 1300 and Ultra Enterprise 2 with no memory, no disk, no Creator graphics
UA11-UEC1-9E-000NN	– Sun Ultra 1 Model 140 or Model 170 chassis upgrade to Sun Ultra 2 Model 1300, 300-MHz UltraSPARC-II with Creator graphics, no memory, no disk
UA11-UEC2-9F-000NN	– Sun Ultra 1 Model 140 or Model 170 chassis upgrade to Sun Ultra 2 Model 1300 with Creator3D graphics, no memory, no disk
UG20-UEC1-9E-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 1300 with Creator graphics, no memory, no disk

Upgrades to Sun Ultra 2 System Model 1300 *(cont.)*

Order Number	Description
UGFS-UEC1-1F-128AC	– Full system upgrade from any SPARCstation to Sun Ultra 2 Model 1300 with 128-MB RAM memory, 4-GB fast internal disk, Creator3D graphics, 20-inch color monitor
UG-M1XXX-M1300	– Module upgrade from Ultra 2 Model 1170 or 1200 to Model 1300
CU14-UEC1-1E-128AC	– Competitive upgrade to Sun Ultra 2 Model 1300 with 128-MB memory, 4-GB fast internal disk, Creator graphics, 20-inch color monitor
CU14-UEC1-1F-128AC	– Competitive upgrade to Sun Ultra 2 Model 1300 with 128-MB memory, 4-GB fast internal disk, Creator graphics, 20-inch color monitor

Upgrades to Sun Ultra 2 System Model 2300

Order Number	Description
UG10-UEC2-9E-256AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with 256-MB memory, 4-GB faster internal disk, Creator graphics
UG10-UEC2-9F-256AC	– Chassis upgrade from SPARCstation 10 to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with 256-MB memory, 4-GB fast internal disk, Creator3D graphics
UG20-UEC2-9E-000AC	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with Creator graphics, no memory, 4-GB fast internal disk
UG20-UEC2-9F-001AC	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with Creator graphics, 1-MB memory, 4-GB fast internal disk
UA12-UEC2-9BN-000NN	– Sun Ultra 1 Model 170E, Model 200E, SPARCstation 20ZX, or Ultra Enterprise 1 chassis upgrade to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, and Ultra Enterprise 2 with no memory, no fast internal disk, no Creator graphics
UG20-UEC2-9E-000NN	– Chassis upgrade from SPARCstation 20 to Sun Ultra 2 Model 230, dual 300-MHz UltraSPARC-II, with Creator graphics, no memory, no fast internal disk
CU14-UEC2-1E-256AC	– Competitive upgrade to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with 256-MB memory, 4-GB fast internal disk, Creator graphics, 20-inch color monitor
CU14-UEC2-1F-256AC	– Competitive upgrade to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with 256-MB memory, 4-GB fast internal disk, Creator graphics, 20-inch color monitor
CU14-UEC2-1F-001AC	– Competitive upgrade to Sun Ultra 2 Model 2300 dual 300-MHz UltraSPARC-II, with 1-GB memory, 4-GB fast internal disk, Creator3D graphics, 20-inch color monitor

Configuration Guidelines

- Memory
  - All SIMMs supported in SPARCstation 20 and Sun Ultra 1 systems are also supported in the Sun Ultra 2 desktop system.
  - Sun Ultra 2 requires memory to be installed in like groups of four per bank. If additional memory is required, order SPARCstation 20 or Sun Ultra 1 memory x-options to obtain additional like SIMMs.
- Disk
  - Internal single-connector fast SCSI-2 disks from the SPARCstation 20 are supported in the Sun Ultra 2 but require a shift of the plastic bracket. Two plastic brackets come with the Upgrade kit.
  - Disk performance will be limited by the performance of the transferred disk(s).
  - The internal floppy drive can be moved to the new system from a SPARCstation 20 or Sun Ultra 1 system.
- AUI
  - Sun Ultra 2 has an MII connector in place of the AUI connector. Customers need to order an MII-AUI adapter if the environment requires connection to an external transceiver through an AUI connection (see the Options section).
- Monitor
  - Older 19-inch monitors may need the default resolution setting changed when used with the Creator or Creator3D graphics. (Please see the Creator graphics Installation Manual for instructions.)
- SCSI
  - The Sun Ultra 2 has a wide SCSI-2 connector (68-pin). Customers need to order a wide-to-narrow SCSI adapter cable if external narrow SCSI devices are to be connected to the system (see the Options section).
- CD-ROM and Tape Devices
  - The internal CD-ROM and tape devices from Sun Ultra 1 systems can be moved to the Sun Ultra 2.
- Graphics
  - Creator and Creator3D graphics cards can be moved from Sun Ultra 1 to Sun Ultra 2 but use a slower-speed SRAM. Graphics performance may be slightly degraded.
  - ZX graphics cards are supported with the Solaris™ 2.5.1 operating environment.

SunSpectrum℠ System Support Program

SunSpectrum℠ is an innovative and flexible service offering that allows customers to choose the level of service best suited to their needs — ranging from mission-critical support for maximum solution availability to backup assistance for self-support customers. SunSpectrum provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the Solaris™ operating system software, and telephone support for Sun™ software packages. The majority of Sun's customers today take advantage of the SunSpectrum program, underscoring the value it represents. Customers should check with their local SunService representative for program/feature variance and availability in their area.

FEATURE	PLATINUM Mission-Critical Support	GOLD Business-Critical Support	SILVER Systems Support	BRONZE Self Support
Systems Features				
Systems approach coverage	Yes	Yes	Yes	Yes
System availability guarantee	Customized	No	No	No
Account Support Features				
Service account management team	Yes	No	No	No
Personal technical account support	Yes	Yes	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semi-annual	No	No
Site activity log	Yes	Yes	No	No
Coverage / Response Time				
Standard telephone coverage hours	7 x 24	7 x 24	8–8, M–F	8–5, M–F
Standard on-site coverage hours	7 x 24	8–8, M–F	8–5, M–F	N/A
7 x 24 telephone coverage	Yes	Yes	Option	No
7 x 24 on-site coverage	Yes	Option	Option	N/A
Customer-defined priority setting	Yes	Yes	Yes	No
– Urgent (phone/on-site)	Live transfer/2 hour	Live transfer/4 hour	Live transfer/4 hour	4 hour/NA
– Serious (phone/on-site)	Live transfer/4 hour	2 hour/next day	2 hour/next day	4 hour/NA
– Not critical (phone/on-site)	Live transfer/ customer convenience	4 hour/customer convenience	4 hour/customer convenience	4 hour/NA
Additional contacts	Option	Option	Option	Option

SunSpectrum System Support Program *(cont.)*

FEATURE	PLATINUM Mission-Critical Support	GOLD Business-Critical Support	SILVER Systems Support	BRONZE Self Support
Enhanced Support Features				
Mission-critical support team	Yes	Yes	No	No
Sun Vendor Integration Program (SunVIP™)	Yes	Yes	No	No
Software patch management assistance	Yes	No	No	No
Field change order (FCO) management assistance	Yes	No	No	No
Remote Systems Diagnostics				
Remote dial-in analysis	Yes	Yes	Yes	Yes
Remote systems monitoring	Yes	Yes	No	No
Remote predictive failure reporting	Yes	Yes	No	No
Software Enhancements and Maintenance Releases				
Solaris enhancement releases	Yes	Yes	Yes	Yes
Patches and maintenance releases	Yes	Yes	Yes	Yes
Sun unbundled software enhancements	Option	Option	Option	Option
Internet and CD-ROM Support Tools				
SunSolve™ license	Yes	Yes	Yes	Yes
SunSolve EarlyNotifier℠ service	Yes	Yes	Yes	Yes

Sun™ Ultra™ 2 Glossary

3D-RAM	Dual-ported video memory with graphics functionality built in to the memory chip.
UPA	UltraSPARC™ port architecture. A high-speed, crossbar-oriented, packet-switched motherboard interconnect.
V9	Version 9 of the SPARC™ architecture.
VIS™	Visual instruction set. A set of instructions implemented in the UltraSPARC CPU and aimed at handling visual or partitioned data.
FastEthernet	IEEE standard for 100-Mbit Ethernet.
100BASE-T	100-Mbit Ethernet.